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**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
|-----------------|-------------|----------------------|---------------------|
| 09/295,607 | 04/22/99 | YAMAZAKI | S 0756-1961 |

MMCI/0403
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EXAMINER

LOKE, S

ART UNIT

PAPER NUMBER

2811

DATE MAILED: 04/03/00

Pleas find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/295,607

Applicant(s)
Yamazaki et al.

Examiner
Loke

Group Art Unit
2811



☒ Responsive to communication(s) filed on Jan 6, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 2, 3, 6-9, 11, 12, and 15-30 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 2, 3, 6-9, 11, 12, and 15-30 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 6

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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1. Claims 8 and 17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification discloses a trace amount of boron, silicon, carbon, oxygen in the aluminum nitride film in page 5, lines 27-32. The specification never discloses a multi-layer insulating film provided on the rear surface of the substrate and comprising an aluminum nitride layer and a silicon oxide layer as claimed in claim 8.

2. Claims 10, 13 and 14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Since claims 1, 4 and 5 have been canceled, it is unclear why claims 10, 13 and 14 are still depended to the canceled claims.

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7-9 and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mano et al. in view of Ikeda (Japanese patent 59-121876 in PTO-1449).

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Mano et al. discloses an active matrix liquid crystal display device in fig. 7. It comprises a polycrystalline silicon thin film transistor formed on a quartz substrate [408].

Mano et al. differs from the claimed invention by not showing an AlN layer formed on the rear surface of the substrate.

Ikeda shows an AlN layer [12] formed on the rear surface of a glass substrate [11] in fig. 1(c).

Since both Mano et al. and Ikeda teach a thin film transistor formed on a glass substrate, it would have been obvious to have the AlN layer of Ikeda in Mano et al. because it prevents a thin film device from deforming at the time of forming the device.

5. Claims 6, 15, 21 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mano et al. in view of Ikeda (Japanese patent 59-121876 in PTO-1449), further in view of Yamazaki et al. (Japanese patent no. 62-112128).

Mano et al. discloses an active matrix liquid crystal display device in fig. 7. It comprises a polycrystalline silicon thin film transistor formed on a quartz substrate [408].

Mano et al. differs from the claimed invention by not showing an AlN layer formed on the rear surface of the substrate.

Ikeda shows an AlN layer [12] formed on the rear surface of a glass substrate [11] in fig. 1(c).

Since both Mano et al. and Ikeda teach a thin film transistor formed on a glass substrate, it would have been obvious to have the AlN layer of Ikeda in Mano et al. because it prevents a thin film device from deforming at the time of forming the device.

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Ikeda differs from the claimed invention by not having at least one of boron, silicon, carbon, and oxygen in the AlN film.

Yamazaki et al. shows a nitride coating [3, 3'] made of a mixture of AlN, SiN and BN can be used as blocking layer for alkali metal in LCD device.

Since both Ikeda and Yamazaki et al. teach an AlN layer formed on a glass substrate, it would have been obvious to have the nitride of Yamazaki et al. in Ikeda because it prevents alkali metal ions diffuse into the display device.

6. Claims 2, 3, 11, 12, 19, 20, 22-26 and 28-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Troxell et al. in view of Ikeda (Japanese patent 59-121876 in PTO-1449), further in view of Yamazaki et al. (Japanese patent no. 62-112128).

Troxell et al. discloses a semiconductor device in fig. 1. It comprises: a polycrystalline silicon thin film transistor formed on a glass substrate [10]; a silicon nitride layer [12] formed on the bottom surface of the glass substrate [10].

Troxell et al. differs from the claimed invention by not showing an AlN layer formed on the rear surface of the substrate.

Ikeda shows an AlN layer [12] formed on the rear surface of a glass substrate [11] in fig. 1(c).

Since both Troxell et al. and Ikeda teach an insulating layer formed on a glass substrate, it would have been obvious to have the AlN layer of Ikeda in Troxell et al. because it prevents a thin film device from deforming at the time of forming the device.

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Ikeda differs from the claimed invention by not having at least one of boron, silicon, carbon, and oxygen in the AlN film.

Yamazaki et al. shows a nitride coating [3, 3'] made of a mixture of AlN, SiN and BN can be used as blocking layer for alkali metal in LCD device.

Since both Ikeda and Yamazaki et al. teach an AlN layer formed on a glass substrate, it would have been obvious to have the nitride of Yamazaki et al. in Ikeda because it prevents alkali metal ions diffuse into the display device.

7. Claims 2, 3, 11, 12, 19, 20, 22-26 and 28-30 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 15-26 of U.S. Patent No. 5,583,369 (Yamazaki et al.) in view of Troxell et al.

Yamazaki et al. discloses a SOI device in fig. 12(E). It comprises: an AlN layer [1102] containing at least one of boron, silicon, carbon and oxygen formed on a glass substrate [1101]; an insulated gate field effect transistor formed on the substrate.

Yamazaki et al. differs from the claimed invention by not showing the channel region comprising crystalline silicon.

Troxell et al. discloses a semiconductor device in fig. 1. It comprises: a polycrystalline silicon thin film transistor formed on a glass substrate [10].

Since both Yamazaki et al. and Troxell et al. teach an insulated gate field effect transistor formed on a glass substrate, it would have been obvious to have the transistor of Troxell et al. in Yamazaki et al. because it is a widely used thin film transistor structure.

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8. Claims 6, 15, 21 and 27 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 15-26 of U.S. Patent No. 5,583,369 (Yamazaki et al.) in view of Mano et al.

Yamazaki et al. discloses a SOI device in fig. 12(E). It comprises: an AlN layer [1102] containing at least one of boron, silicon, carbon and oxygen formed on a glass substrate [1101]; an insulated gate field effect transistor formed on the substrate.

Yamazaki et al. differs from the claimed invention by not showing the channel region comprising crystalline silicon.

Mano et al. discloses a semiconductor device in fig. 7. It comprises: a polycrystalline silicon thin film transistor formed on a quartz substrate [408].

Since both Yamazaki et al. and Mano et al. teach an insulated gate field effect transistor formed on a substrate, it would have been obvious to have the transistor of Mano et al. in Yamazaki et al. because it is a widely used thin film transistor structure.

9. Applicant's arguments filed 1/6/00 have been fully considered but they are not persuasive.

It is urged, in pages 7-8 of the remarks, that the specification discloses a trace amount of boron, silicon, carbon, oxygen in AlN. However, the specification never discloses a multi-layer insulating film made of an AlN layer and a SiO layer formed on the rear surface of the substrate as claimed in claim 8.

It is urged, in page 8 of the remarks, that Mano never suggests AlN insulating film containing therein at least one of boron, silicon, carbon, and oxygen. Since claim 8 never discloses the AlN

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insulating film containing at least one of boron, silicon, carbon, and oxygen, it is not necessary for the combined device of Mano et al. and Ikeda to have an AlN insulating film containing at least one of boron, silicon, carbon, and oxygen.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (703) 308-4920.

sl

March 30, 2000

STEVEN H. LOKE
PRIMARY EXAMINER
(GROUP 200)

Steven Loke